

## The Vedic Calendar and the Rituals (1)

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**0.** The astronomical knowledge or the calendar system in the Vedic period until about the middle of the 1<sup>st</sup> millennium B.C., though scarcely investigated hitherto, differs fundamentally from the later Indian astronomy or astrology after the Jyotiṣa (as a Vedāṅga ‘limb of the Veda’ belonging to the post Vedic period) onward. This paper offers remarks about basic elements of the Vedic calendar, especially in its early stage, drawn from materials found to a great extent fortuitously by the author.

### 1. The peculiarity of the Vedic calendar

Time itself simply goes forward without pause and without return. But nature repeats various periodic changes: day and night, waxing and waning of the moon, lengthening and shortening of the daylight accompanied by the north- or southward movement of the sun, rotation of the constellations as well as the seasons, etc. The regularity of those phenomena must have deeply impressed our ancestors, which led them, on the one hand to the concept of the highest principle ruling the phenomena, and on the other hand to the reckoning of time for practical use. The time-reckoning systematized into the calendar brought forth revolutionary developments in human life, for secular as well as religious activities.


The periodicity of nature is expressed in Old Indo-Aryan language by the nouns to the verbal root *\*h<sub>2</sub>er* ‘to fit, fügen’: *ṛtū-* (masc.) ‘the right time in exact accordance with the temporal cycle’ means above all ‘monthly period fit for conception of (children by) women’ and more generally ‘season’; *ṛtá-* (nt.) ‘the cosmic order which regulates not only nature, but also human conduct’ (→ 3.2. str.1, 3.3., n.5) is the most important concept in the early Vedic literature. The simplest but lifelong obligatory ritual for those who have set up their sacrificial fire is the Agnihotra, the daily offering to the fire at sunset and sunrise, which incited them to observe the sun’s movement. No less important are the new and full moons at which the New and Full Moon Sacrifices (*darsapūrṇamāsau*) as well as most of the Vedic

rituals take place. An accurate forecast of the new and full moons was indispensable.

The ancient Indian calendar in the Vedic period until about the 5<sup>th</sup> century B.C., as attested in the Saṃhitās, the Brāhmaṇas [Br] (inclusive of the prose-portion of the Black Yajurveda-Saṃhitās), the old stage of the Upaniṣads and of the Śrautasūtras, is a lunisolar calendar based on naked eye observations<sup>1)</sup> of heavenly bodies, which sets special importance on the moon's motion in relation to the movements of the sun and the fixed stars. The calendar date is determined by the moon's phase and position relative to the stars, which are observed in the nocturnal sky (→ 2., 3.1., 3.2. str.19).

When the moon is seen from the earth in the same direction as the sun, that is, in conjunction with the sun, the moon does not appear in the nocturnal sky. The moon is considered to stay (*vas*) at home (*amā*) with the sun in this night called *amāvāsyā-rātri*- (later *rātri*-) 'the night of (the moon's) staying overnight at home' (→ 3.1., 3.2., 3.4.A). After that, the thin new moon appears in the west after the sunset; changing its phase by waxing and waning, the moonrise or moonset becomes later as the sunset or sunrise every day on average by about 51 minutes (presumably the origin of the time unit *muhūrtā*- [a 30th of a solar day] → seq. 8.); consequently, the moon comes again into conjunction with the sun and disappears (→ 3.4.B). During the period between two successive conjunctions with the sun (the lunation: about 29.5 solar days), i.e. the synodic month, the moon moves in its orbit, approaching every night a different star or star-group which becomes thereby invisible, until it joins again with the sun. This phenomenon was understood as follows: the moon (masculine god) stays every night with a different star or star-group (each regarded as a feminine divinity) situated on its path, 28 or 29 nights in total, and stays at home with the sun during the Amāvāsyā night (→ 3.2., 3.4.). The star(-group)s as well as the sun visited by the moon are named *nakṣatra*- (nt.) 'the place to which the moon attains (*nakṣa*-<sup>2)</sup>)', commonly translated "lunar mansion" or "Mondhaus" (→ seq. 5). *nakṣatra*- is attested in the Ṛgveda [RV] where the singular form (nt.) always means the sun, while the star in general is expressed by the word of Indo-European origin (*\*h<sub>2</sub>stér*-), *stár*- (RV: intr.pl. *stj̥bhīh*, nom.pl. *tārāh*), later *tārakā*- (AV+, MIA *tārakā-/tārayā*-) and *tārā*- (Class. Skt., MIA). After the RV on, the sun was excluded from the Nakṣatras.

An enumeration of the 28 Nakṣatras, remarkable star(-group)s situated approximately equidistant on or near the moon's path, appears first in the Atharvaveda [AV] (Śaunaka XIX 7,1-5; not found in the Paippalāda-recension). The number of the Nakṣatras is reduced into

27 in the prose  on of the Kāthaka-Saṁhitā [KS] XXXIX 13:130,14ff, and the Taittirīya-Saṁhitā [TS] IV 4,10,1ff., but increased to 29 in the Maitrāyaṇī Saṁhitā [MS] II 13,20:165,12. The varying number of the Nakṣatras reveals the problem caused by the divergence between the sidereal month (i.e. the cycle of the moon's revolution relative to the stars: about 27.32 solar days  $\approx$  27 days 8 hours) and the synodic month (about 29.53 solar days  $\approx$  29 days 13 hours) which is about 2 days 5 hours longer than the former due to the revolution of the earth around the sun. According to the 28 (or 29) Nakṣatras based on the synodic month, the moon's relation to the Nakṣatras becomes unstable; by contrast, the 27 Nakṣatras based on the sidereal month are in disaccord with the calendar date of the synodic month ( $\rightarrow$  3.1.). The 27 Nakṣatras model, preferred in the scholastic tradition, was transmitted to the post Vedic work Jyotiṣa, while the 28 Nakṣatras survived in the tradition of the AV such as the AV-Pariśiṣṭa, and further in early popular calendars, traces of which remain in the Buddhist texts, e.g. the Mahāniddeśa 382,4f. (Pāli Canon), the Śārdūlakaraṇvādāna 51f. (Divyāvādāna). In either case, the term Nakṣatra means concrete heavenly bodies related to the moon in the Vedic literature, and to a large extent in early popular calendars. In this regard, it should not be forgotten that the stars near the bright moon or in conjunction with the moon are invisible to the naked eye. The Nakṣatra at which the moon stays each night can be only inferred from attentive and continuous observation of the nocturnal sky. In the Jyotiṣa, the notion of the Nakṣatras was transformed into the equally spaced zones of the ecliptic. This marks the radical change from primitive astronomy to mathematical astronomy as an exact science. For the details of the Nakṣatras, s. seq. 5.

## 2. The calendar day

A calendar day is a solar day which begins originally at sunset, i.e. a night and the following daytime, as in the Jewish or Arabic calendar, since the date is determined by the moon's phase observed at night ( $\rightarrow$  3.1.). Thus *paurṇamāsī*- (fem., [rātrī-/rātrī-]) 'the full moon night' designates 'the full moon day, i.e. the full moon night and the following daytime', identical with *paurṇamāsā*- (nt. [āhan-]); in the same way, *amāvāsyā*- means 'the Amāvāsyā night and the following daytime', *āṣṭakā*- 'the 8<sup>th</sup> night of the half month and the following daytime', etc. This usage is frequent in the Br and the ŚS, e.g. MS<sup>p</sup> I 6,9:101,17f. *yāt paurṇamāsyāṁ vāmāvāsyāyām vāgnīm ādhattā, ubhé puṇyāhé* 'That [one] sets up one's sacrificial fire in the daytime following the full moon night or the Amāvāsyā

night, [that is to say] the both are auspicious days', Vaitāna-Sūtra 31,1 *māghyāḥ purastād ekādaśyām saptadaśāvaraḥ sattram upayanto brāhmaṇoktena dīkṣeran* 'In the daytime following the 11<sup>th</sup> night (of the waxing half month) before the full moon situated at the Maghās (fem. pl. Leonis α, etc. → seq. 5.), at least 17 [persons], if they are undertaking a Sattra, should consecrate themselves according to the prescript in the Br' (≈ Baudhāyana-ŚS XVI 13:260,5), Kātyāyana-ŚS 13,1,2 *gavāmayanāyaikāṣṭakāyām dīkṣā* 'The consecration for the Gavāmayana [takes place] in the daytime following the 8<sup>th</sup> night of the waning half of the Māgha month (*ekāṣṭakā-*)'. The reckoning of calendar days by the night is common, e.g. MS<sup>p</sup> I 5,13:82,2-5 *yātra pāñca rātriḥ sāmhitā vāset tāj juhuyāt ... daśāsv evā rātrīṣv antamām hotavyām* 'Where one stays overnight for more than 5 successive nights, one should there make an offering [to Rudra Vāstoṣpati] ... After 10 nights [have passed], one should make an offering on the last [day]'.

This old calendar day system is reflected in the Agnihotra (→ 1.); the offering at sunset precedes that at sunrise and is treated as representative of both offerings. It is further inferred that the prototype of the New and Full Moon Sacrifices (*darśapūrṇamāsāu*) begins with the sunset of the Amāvāsyā or the full moon night, i.e. the sacred night for *upavasathā-* 'staying overnight near the sacrificial fire (with observance of sacrificial duties)'. Though the Upavasatha designates 'the preparatory day for the New and Full Moon Sacrifices' in the system of Śrauta-rituals, its original meaning survives in the Uposatha ceremony of Buddhism and Jainism (MIA *uposatha-* < OIA *upavasathā-*).

A new calendar day beginning at sunrise as in the Jyotiṣa seems, however, to have prevailed over that beginning at sunset, as the worship of the sun became predominant.

### 3. The calendar month and the date

**3.1.** A calendar month (m. *mās-*, *māsa-*; cp. *mās-*, *candrāmās-*, *candrā-* 'the moon') is a synodic month starting with the Amāvāsyā night, during which the moon comes into existence from non-existence, waxes to the full moon, wanes to disappearance. The moon's cycle is compared with the human life of birth, growth, decay and death; the new moon after the conjunction symbolizes rebirth after death (→ 3.2., 3.3., 3.4.). The predominance of the conjunction over the full moon in origin explains why the New Moon Sacrifice was given more weight than the Full Moon Sacrifice, cp. the two offerings of the Agnihotra (→ 2.).

The full moon (moon age 14.8) occurs when the moon is seen from the earth in the

opposite direction of the sun. The Nakṣatras, which are fixed stars, gradually change their position in the sky according to the annual revolution of the earth around the sun. In consequence, the Nakṣatra at which the full moon lodges shifts every month. The calendar month is designated according to the Nakṣatra at the full moon: e.g. the Nakṣatra *citrā-* → the full moon night *citrī-* (*rātrī-*) → the month *caitra-*. As an instrument to distinguish the months from each other, the full moon night increased its importance.

A month is composed of a waxing half month (*śukra-pakṣa-* ‘bright wing’) and a waning half month (*kṛṣṇa-pakṣa-* ‘black wing’). The date is expressed by the night as counted from the Amāvāsyā night or the full moon night in each half month: e.g. *āṣṭakā-* ‘the 8<sup>th</sup> night of the *śukra-pakṣa-* or the *kṛṣṇa-pakṣa-*’, in which the half moon (moon age about 7.2 or 22) appears, means a calendar day composed of this night and the following daytime (→ 2.).

The lunation, though variable by more than 13 hours according to the moon’s speed in its orbit, is on average about 29.53 solar days ( $\approx$  29 days 13 hours). Due to the divergence between the lunar cycle (month) and the solar cycle (day), the conjunction as well as the full moon occurs every month at different time, also in the daytime, from which arises difficulty in determining the Amāvāsyā or the full moon night. Actually it was not rare to begin the New or the Full Moon Sacrifice one day before or after the correct date, for which the expiation (*prāyaścitti-*, *citta-*) is prescribed in the Br and the ŚS. A similar problem concerning the Upasatha is discussed in the Vinaya of the Buddhist Canon (→ seq. 9.).

The divergence between the synodic month and the solar year (on average about 365.24 solar days) causes the full moon or conjunction to shift by about 11.24 solar days a year (→ seq. 4.). Consequently, the full moon or the conjunction changes every year its relation to the vernal and autumnal equinoxes and the summer and winter solstices as well as its position relative to the fixed stars. The full moon is situated often between two Nakṣatras in discordance with the fixed Month’s name based on the Nakṣatra at the full moon.

The above mentioned inaccuracy always accompanies the Vedic calendar, which is based upon naked eye observations of the moon’s position relative to the stars.

Beside the actual calendar used in the Vedic Period, a notional calendar appears in the Br, according to which a month is composed of 30 days and a year of 12 months, namely 360 days. This conception seems to underlie the 29 Nakṣatras in the MS<sup>p</sup> (→ 1., seq. 5.) and to have prepared the notions of *tithi-* and *muhūrtā-* (→ seq. 8.). This calendar system is favored by the Brahmin scholars in theological speculation regarding the complete year

(*saṁvatsarā-*) which symbolizes eternity (→ seq. 4.).

### 3.2. The moon's marriage with the sun: RV X 85 (≈ AV XIV 1)

The marriage of the moon (King Soma) and the Sun goddess Sūryā (daughter of Savitṛ)<sup>2)</sup> symbolizes the conjunction of the moon and the sun; their wedding implies the New Moon Sacrifice (str.3-5), which is further combined with the rituals such as the Animal Sacrifice at the summer or winter solstice (str.13 → seq. 5.f.). The word *sóma-* is used in manifold senses: Soma sap squeezed from a certain plant (most probably ephedra), the gods' food which brings immortality (*amṛta-*, “ambrosia”) and the moon (→ 3.4.).

1. *satyénóttabhitā bhūmih<sup>1</sup> | sūryenóttabhitā dyáuḥ | ṛténādityāś tiṣṭhanti<sup>1</sup> | divi sómo ádhi śritāḥ ||*  
The earth is upheld by the truth (*satyá-*) ; the heaven is upheld by the sun, By the cosmic law (*ṛtá-* → 1., n.5), the Āditya-gods stand; Soma (the moon) is clinging on the heaven.
2. *sómenādityā balīnaḥ<sup>1</sup> | sómena pṛthivī mahī | átho nákṣatrāṇām eṣām<sup>1</sup> | upásthe sóma āhitaḥ ||*  
By Soma, the Āditya-gods are powerful; by Soma, the earth is great. And then, Soma is placed on the lap of these Nakṣatras.
3. *sómam manyate papivān<sup>1</sup> | yát sampiṇśánty oṣadhim | sómam yám brahmāṇo vidúr<sup>1</sup> | ná tásyāś-nāti kás caná ||* [The sacrificer] thinks that he has drunk Soma, when [the priests] squeeze the plant (stalk of Soma). Whoever [may be on earth,] does not eat Soma (the moon) which [only] the priest-scholars know.

The offering of Soma sap to the gods on the day following the Amāvāsyā night brings forth the moon's rebirth and waxing, which suggests the origin of the New Moon Sacrifice (→ 3.4.A).<sup>3)</sup> On this day, the moon in conjunction with the sun is situated high in the bright heaven and invisible, being covered with sunrays (*raśmí-* masc. pl.):

4. *āchádvidhānair gupitó<sup>1</sup> | bārhatāih soma rakṣitāḥ | grāvam íc chṛṇván tiṣṭhasi<sup>1</sup> | ná te aśnāti pārthivaḥ ||* Protected by the arrangements for covering (i.e. sunrays?), guarded by those belonging to the height (i.e. winds?, cf. str. 5), o Soma, you stand hearing the very press stone (of the Soma plant). One who belongs to the earth does not eat you.
5. *yát tvā deva prapibanti<sup>1</sup> | táta ā pyāyase púnaḥ | vāyúḥ sómasya rakṣitā<sup>1</sup> | sámānām māsā ākṛtiḥ ||*  
When [the gods] begin to drink you (as Soma sap offered in the New Moon Sacrifice), o God, then you (as the moon) swell again. The wind is Soma's protector; the month (*māsa-*) is the basic form of the years.

The str. 6-17 describe the wedding procession of Sūryā on the Ásvins' wagon (→ seq. 5.)

13. *sūrydyā vahatíḥ prágāt<sup>1</sup> | savitā yám avāśṛjat | aghāsu hanyante gāvó-<sup>1</sup> | ṛjunyoh páry uhyate ||*  
The wedding procession of Sūryā, whom Savitṛ sent off, has started. [When the full or new moon is situated] at the [Nakṣatra of] Aghās (fem.pl., AV XIX 1,13 Maghās → 2.), cattle

are slaughtered [for the sacrifice]. [When...] at the [Nakṣatra of the] Arjunis (fem.du.; AV Phalgunis), Sūryā is carried around [from the father's to the bridegroom's house].

The str. 18-19 (≈ AV VII 81,1f.) praise the wonderful faculty (*māyā-*) of the sun and the moon, especially the moon which repeats rebirth and guarantees long life (→ 3.3.).

18. *pūrvāpāraṃ carato māyāyitāu* <sup>1</sup> *śiśu krīṇantau pāri yāto adhvarām* | *viśvāny anyo bhūvanā-bhicāṣṭa* <sup>1</sup> *ṛtūnr anyo vidādhaḥ jāyate pūnaḥ* || Alternatively [going] ahead and behind [each other], these two wander with wonderful faculty (*māyā-*) (i.e. the moon proceeds the sun before the conjunction, after which the sun proceeds the moon); the two playing children go around the ritual way. The one (the sun) observes all the beings; the other (the moon), disposing the periods (months, seasons, etc.: *ṛtū-* → 1.), is born again.

19. *nāvo-navo bhavati jāyamāno-* <sup>1</sup> *ḥnām ketūr uśāsām ety āgram* | *bhāgaṃ devēbhyo vī dadhāt* *āyān* <sup>1</sup> *prā candrāmās tirate dūrghām āyuh* || [The moon] becomes [each time] new and new, when he is born; as bright sign (*ketū-*) of days, he goes on the top of dawns (i.e. appears before the dawn). He, coming [to the earth in the Amāvāsyā night?], distributes the share to the gods. The bright moon (*candrāmās-*) makes [us] to accomplish [our] long lifetime.

[Str. 20-47 are omitted.]

### 3.3. The moon's marriage with the Nakṣatras: Prose-portion of the Black Yajurveda

A person afflicted by *yākṣma-* (or *rājayakṣma-*) “consumption”<sup>4)</sup> is compared with the waning moon. The moon's rebirth and waxing are combined with the ritual for the healing from this disease, the mantras for which are parallel to RV X 85,18f. (→ 3.2.). With regard to this ritual, the origin of the waning and waxing of the moon caused by its marriage with the Nakṣatras is related (MS<sup>p</sup> II 2,7:21,4-14; KS<sup>p</sup> XI 3:147,1-12; TS<sup>p</sup> II 3,5,1-3).

MS<sup>p</sup> II 2,7:21,4-9 *prajāpatir vāi sōmāya rājñe duhitṛ adadān nākṣatrāṇi. sá rohinīyām evāvasan, nētarāsu, tā ānupeyamānāḥ pūnar agacchanis, tāṃ rājayakṣmēnāgrāhayat, sá nīrasravat, tāsmād rājayakṣmāgghito niḥsravati, sá vāi prajāpatim evōpādhāvat, tāṃ prajāpatir abravīd, ṛtām brūhīti, sá ṛtām abravīd, yāthā sārvasv evā samāvad vāsānīti, tāsmād eṣā sārvasv evā samāvad vasati.* Prajapati, verily, gave to King Soma (the moon) his daughters, [who were] the Nakṣatras. He (King Soma) lodged only at Rohiṇī, not at the others. Those who were not being approached [by King Soma] went back [to Prajapati]. [P] made him grasped by the *rājayakṣma-*. He (i.e. his body fluids [Soma sap]) dripped out (KS *tṛṇam ivāsuṣyat* He shriveled like grass). Therefore one grasped by *rājayakṣma-* (i.e. one's body fluids [urine, sweat, blood, etc.]) drips out. He (King Soma), verily, ran for help indeed to P. P said to him: “say [what accords with] the cosmic order (i.e. swear an oath)<sup>5)</sup>”. He said [what accords with] the cosmic order (i.e. swore an oath): “[The cosmic order is so,] as (*yāthā*) I shall (subj. *vāsāni*)<sup>6)</sup> lodge equally indeed at all [the P's daughters=Nakṣatras]”. Therefore this (King Soma) lodges equally indeed at all [the P's daughters].

The marital custom in older times seems to be reflected in this myth. In the TS, the number of the Prajāpati's daughters is 33, but not designated as Nakṣatras. Noteworthy is the significance of Rohiṇī (→ 5), usually identified with Aldebaran (Tau α) which was situated approximately at the vernal equinox around the 12<sup>th</sup> century B.C.

### 3.4. The moon as food of the gods or Indra (the sun): Śāthapatha-Brāhmaṇa I 6.4

The moon's and the sun's movements are explained from the viewpoint of circulation of the food for Indra and the gods (→ 3.2.)<sup>7)</sup>. Indra is equated with the sun, as usual in the ŚB.

A) The former part of this Br relates that both Indra (the sun) and King Soma (the moon) stay in the Amāvāsyā night at home, i.e. on earth, with a theological etymology of *amāvāsyā*- (→ 1) from *amā* adv. and *vasa*- " ~~of~~ *vāsu*- m. (i.e. Indra) and nt. (i.e. King Soma).

*H with the subjects*

[On the offering of Puroḍāśa (a kind of pan-cake) to the pair of Indra and Agni]

... *ténaitām rátriṃ sahājagāma. sá vai devānām vásur. víró hy eṣām. //2// té devā abruvan. / amā vai no 'dyá vásur vasati yó naḥ právātsid iti. ... //3// ...* [Agni] came back [to the earth] with him (Indra who had been hidden) in this (Amāvāsyā) night. He (Indra) is, verily, the good [god] (*vāsu*- m.) among the gods, for he is a hero among them. Then the gods said: "At home (*amā*), verily, stays now the good [god] among us, who went on journey [to fight with Vṛtra] for us".

The Indra's home, though not directly expressed, must be the earth, since his companion Agni stays on earth in the Amāvāsyā night for the Upavasatha of the New Moon Sacrifice.

[On the offering of Sāmnāyā (mixture of sour and fresh milk) to Indra]

... *eṣá vai sómo rájā devānām ānam yac candramāḥ. sá yatraiṣá etām rátriṃ ná purástān ná paścād dadṛśe tát imám lokám āgacchati. sá ihāivāpás cauśadhiś cá práviśati. sá vai devānām vásu. ānam hy eṣām tát. yád eṣá etām rátriṃ ihāmā vásati tásmād amāvāsyā náma. //5//*

This King Soma is, verily, food of the gods, when [he is] the moon. When this (King Soma) as such (the moon) is seen neither in the east nor in the west this whole night, then he comes to this world (cf. ŚB XI 1,1,4). He enters just here into waters and plants. He is, verily, the goods (*vāsu*- nt.) of the gods, for he is food of the gods. From that this [King Soma as the moon] stays this whole night here at home (*amā*), [this night is] *amāvāsyā* by name.

From the offering of Sāmnāyā, equated with Soma, the moon is born anew (→ 3.2., n.3) :

... *tád enam adbhyaś ośadhibhyaḥ sambhṛtyāhutibhyó 'dhi janayati. sá eṣá āhutibhyo jātāḥ paścād dadṛśe. //15//* ... Then [one] collects him (King Soma as the moon) from waters, from plants, and makes him to be born from offerings [of the collected Soma]. Thus this (King Soma as moon), born from offerings, is seen in the west.

B) In the later part of this Br, the sun's and the moon's motions are described respectively



as Indra's and his rival Vṛtra's actions. The moon (Vṛtra) approaches the sun (Indra) from afar and is devoured by him in the Amāvāsyā night. Sucked out and thrown out by the sun, the moon appears again in the west and waxes to become his food:

*tād vā eśā evēndrah / yā eśā tāpaty. áthaiśā evā vṛtró yác candrámah. sò 'syaiśā bhrātṛvyajan-meva. tásmād yády ápi purā vidūram ivoditó 'thainam etām rātrim úpaivā nyāplavate, sò 'sya vyāttam āpadyate. //18// tām grasitvódeti. / sá ná purástān ná paścād dadṛṣe. ... //19// tām nirdhīya nirasaty. / sá eśā dhītāh paścād dadṛṣe. sá púnar āpyāyate. sá etāsyaivānnādyāya púnar āpyāyate. ... //20//* Then, verily, this very one is Indra, this which heats (i.e. the sun). On the other hand, this very one is Vṛtra, if [it concerns] (yád) the moon. This (Vṛtra) as such (the moon) has just the nature as his (Indra's) rival. For this reason, even though [Vṛtra = the moon] was risen formerly just far away [from Indra = the sun], after that, [Vṛtra] floats just near to him (Indra) this (Amāvāsyā) night. He (Vṛtra) attains to his (Indra's) opened mouth. [Indra] rises after he has devoured him (Vṛtra). He (Vṛtra) is seen neither in the east nor in the west. ... After [Indra] has sucked out him, [Indra] throws out him. Thus sucked out, this (Vṛtra) is seen in the west. He swells again. He swells again for (in order to become) food of this very [Indra].

To be continued (: 4. The calendar year, 5. The Nakṣatras, 6. The beginning of the year, 7. The seasons, 8. The shorter time unit, 9. Influences on the popular calendar).

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- 1) For astronomical instruments in ancient India, cf. ÔHASHI, Development of the astronomical observation in Vedic and Post-Vedic India, *Indian Journal of History of Science* 28 (3), 1993, 185-251, esp. 195-197. 2) For this marriage, cf. Kauṣītaki-Br XVIII 1 (Sūrya's father is Savitṛ or Prajāpati), Aitṛeya-Br IV 7 (Prajāpati). 3) The main oblation of the New Moon Sacrifice might have been in origin Soma, which was substituted by Sāmnāyā, then replaced by Purodāśa. 4) Cf. Zysk, *Medicine in the Veda*, 1985 [rep. 1996], 12-17: *yákṣma* (consumption; tuberculosis). 5) *ṛtá-* (→ 1., 3.2.str.1) as "truth" or "Wahrheit" (TICHY, *Konjunktiv* 143 with Anm.190; AMANO, *Maitrāyaṇī Samhitā* I-II, 487 with Anm.2040f.) is difficult to accept. For *ṛtām + am<sup>i</sup>/brū/vad/kr* 'Eid leisten, swear an oath', cf. Hoffmann, *Aufsätze* I 292 with Anm.17. Cp. the parallel KS *ṛtām amiśva yāthā ... sá ṛtām amit*. 6) The subj. *vāsāni* in the *yāthā*-clause in the MS expresses what the cosmic order requires. 7) The gods' food (Soma as moon) or nourishment in general circulates in the cosmos as described in ŚB I 6,4,5f.; 15, XI 1,1,4f., VI 2,2,16, XI 6,2,6-10, s. Author, *Fs. Narten*, 2000, 248f; *Akten des 27. Deutschen Orientalistentages*, 1998 [2001], 159-162. For the circulation of vital energy in the cosmos, s. Author, *Studies in Religions East and West* 35, 2008 [2009], 97-100 (in Japanese).

⟨Key words⟩ astronomy, calendar, *ṛtú*, *ṛtá*, *nákṣatra*, *amāvāsyā*, *sóma*, *agnihotrā*, *darśapūrṇamāsáu*, Indra, Vṛtra, Ṛgveda, Atharvaveda, Yajurveda-Samhitā, Śatapatha-Brāhmaṇa. (ret. Associate Professor, Osaka City University; Dr. de 3ème cycle, Université de Paris III)



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